

AN OPHIURIAN SHOAL ON THE MISSISSIPPI COAST¹

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On July 15, 1959, R. A. Woodmansee and I conducted a field trip on the Gulf Coast Research Laboratory vessel *Hermes* to the east end of Ship Island, Mississippi. This island is one of the barrier islands that lies a few miles to the south of the mainland, and which forms part of the seaward boundary of Mississippi Sound. Ship Island is composed of coarse sand in contrast to the mud bottom of most of the Sound and the sandy mud to seaward in the Gulf of Mexico. The island is oriented roughly ENE and WSW, and the eastern end is one of the closest localities to the Laboratory where a truly marine fauna can be found.

Observations were begun in shallow depths around the tip of the island. The water, usually murky with sediment, was unusually clear, and made diving with a face mask practical. As I worked my way around to the Gulf side of the island, I observed slender flexible objects, usually paired, projecting from the sand. Digging revealed these to be the arms of a brittle star that was living with its body buried about three inches in the sand. Most, apparently, had two arms projecting, but the number ranged from one to three. A little to the westward of where they were first found, their numbers increased, and soon there appeared to be a forest of small arms extending an inch or two above the sand. The densest part of this "ophiurian shoal" was in a depth of three to four feet, and was more than a hundred feet out from the beach.

Specimens collected were later identified as *Ophiophragmus wurdemani* Lyman (family Amphiuroidae). However, as the systematics of this genus is rather involved, several specimens were sent for examination to Lowell P. Thomas at The Marine Laboratory, University of Miami. His opinion, in a communication dated January 24, 1961, was that "the specimens of *Ophiophragmus* which you recently sent me (1959) are very close to *O. wurdemani*, but differ slightly in several respects and could represent an undescribed species. Until we know more about speciation in this genus an identification cannot be made with certainty."

¹ Contribution No. 376 from the Marine Laboratory, University of Miami.

The environment in which these brittle stars were taken is fairly typical of the northern gulf coastal waters. The water is rather turbid, and contains a considerable amount of organic matter (Priddy, *et al*, 1956). The salinity is reduced, and is usually about 30°/00 where the Gulf and Mississippi Sound meet; however, this may be considerably reduced by heavy precipitation, and a surface salinity of 11.5°/00 has been reported from the northern side of Ship Island (Moore, 1961). Thomas (1961) has reported that *O. wurdemani* is found in a similar environment along the west coast of Florida.

The habit of protruding one or more arms from the sand is undoubtedly a method of feeding. The great concentration of *O. wurdemani* at Ship Island was able to take advantage of the tidal currents flowing past the tip of the island. The water is laden with a rich load of organic material, yet salinities apparently remain within the range of tolerance for this organism during all but the most adverse conditions. Little is known about the biology of *O. wurdemani*, but burrowing habits of the family Amphiuridae have been described by Des Artes (1910). What little information there is appears to be almost entirely systematic or geographical, and no one has mentioned its habit of protruding its arms from the sand.

A comparable phenomenon has been reported by Mitsukuri and Hara (1897) for a shoal in the shallow waters of Kagoshima Bay, Japan. They found large numbers of brittle stars in very shallow water in an environment similar to the Mississippi shoal. The brittle stars in this case were described some years later by Matsumoto (1915) as *Amphiura vadicola* (family Amphiuridae).

Two such similar occurrences in closely related animals on opposite sides of the earth is of interest. In both cases, the animals took advantages of local conditions, and protection from predators and a bountiful food supply made it possible for great numbers to survive and prosper. Moore (1956) has reported that large numbers of the echinoderm, *Mellita quinquesperforata* Leske, a sand dollar, exist in the shallow coastal waters of the northern Gulf. However, there is apparently no record of large concentration of amphiurids in the shallow waters of the United States. This may be because suitable habitats are limited, and that these localities are in areas where turbid waters are the rule and discourage underwater observation.

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